Fabrication of Photovoltaic Dress to Power Electronic Devices

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Harnessing the fashion industry (worth $1.7 trillion) could expand the integration of photovoltaic (PV) energies (worth $80 billion) into daily life. Expansion could increase popularity of PV and positively affect its market, declining fossil fuel use. Few garments with PV have been fabricated, and little is known about the garments' viabilities. To promote green energy as an alternative for charging devices, and establish this integration's viability, a PV dress was fabricated to charge cell phones and tablets; with focus on approximate latitude-based angles and garment washability. The goal was to create a dress of 12 polycrystalline cells regulated to 5.1V and 500mA, to completely charge a Windows cell phone and tablet. The factors of evaluation were artificial light versus outdoor light, and the rate of charging. Due to poor lighting conditions from winter testing, the phone was not completely charged; however, the dress did produce enough energy for a trickle charge. Indoor lighting conditions were less than ideal, not producing enough energy for a charge. In early Spring, testing was done in stronger sunlight conditions and a steady charge was achieved. Overall, without decent sunlight conditions and exposure, the solar cells had a difficult time producing enough electricity for even a moderately paced phone charge. Following testing, it was established that charging a device is possible with solar integration into fashion, but without further development and financial availability, it will not become a viable technology in fashion.

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